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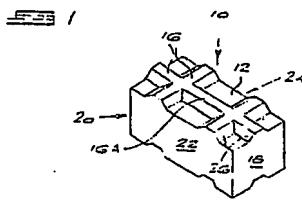
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(58) Field of search

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Selected US specifications from IPC sub-class E04C

(54) Building blocks

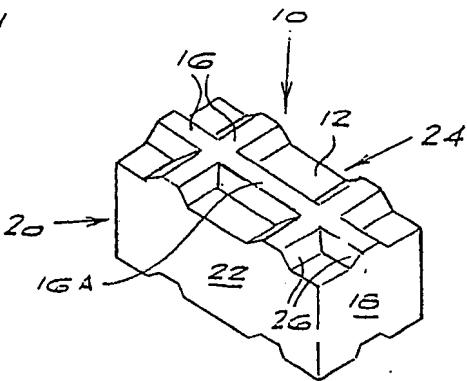
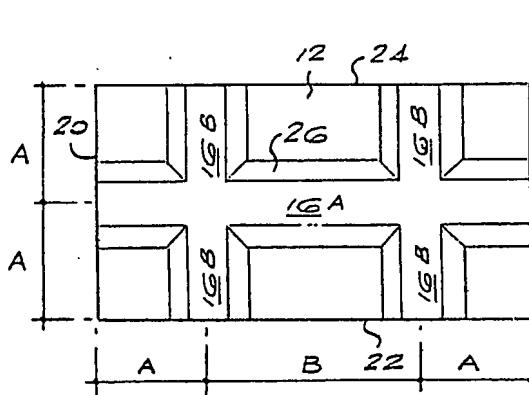
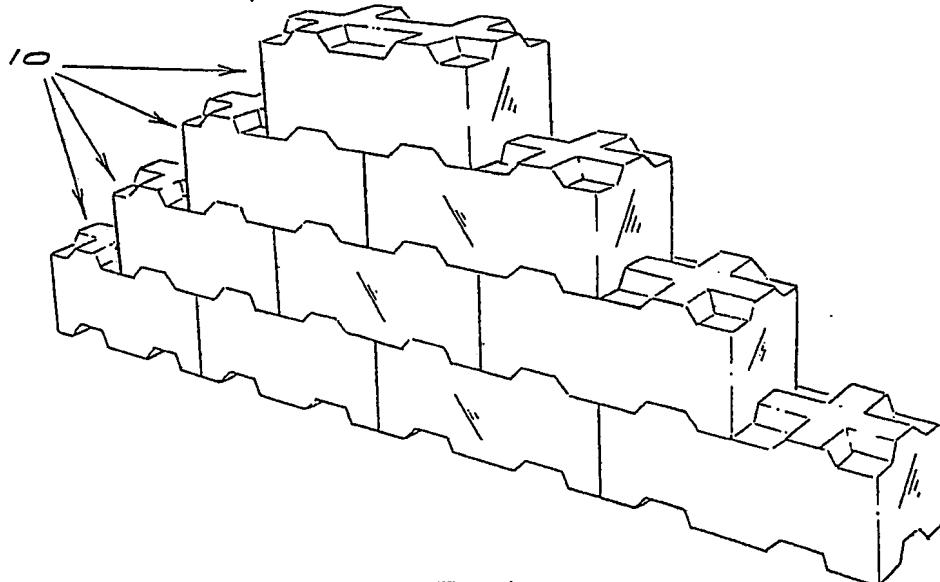
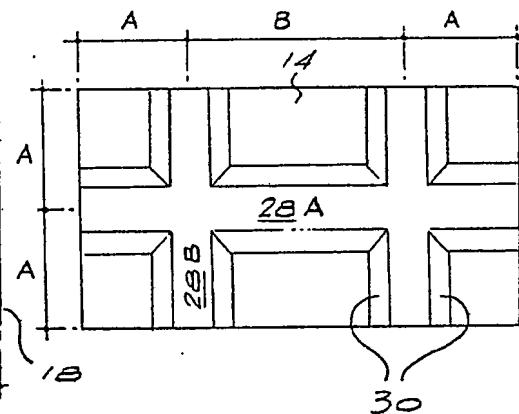
(57) An interlocking building block 10 has complementally interlocking projections 16 and recesses 28 (Fig 3) on opposite surfaces thereof. The projections are provided by ribs arranged to form at least one upstanding cruciform shape.



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FIG. 1FIG. 2FIG. 3FIG. 4

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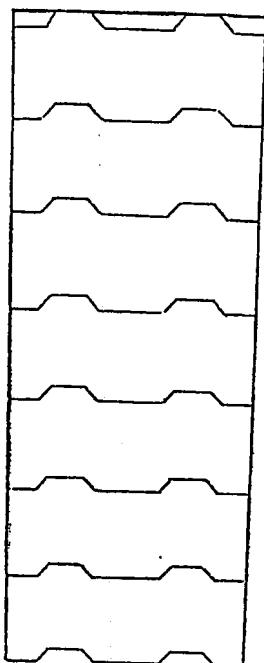


FIG. 5

FIG. 6

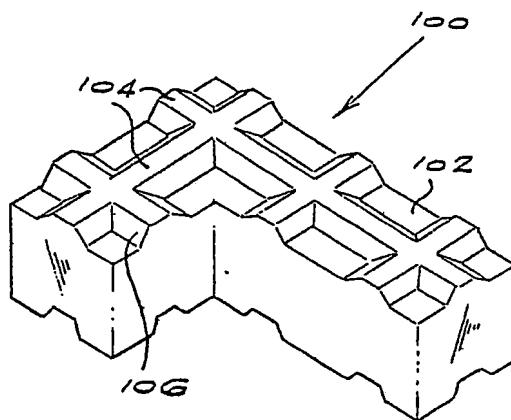
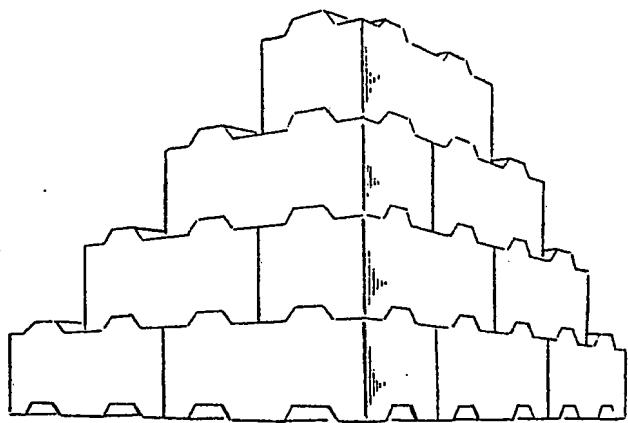


FIG. 7

FIG. 8

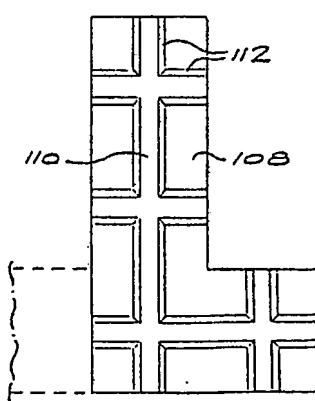
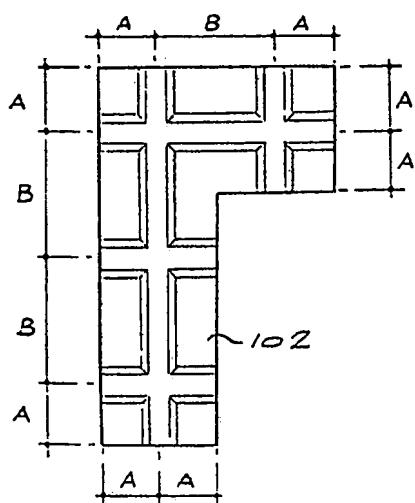


FIG. 9

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FIG. 10

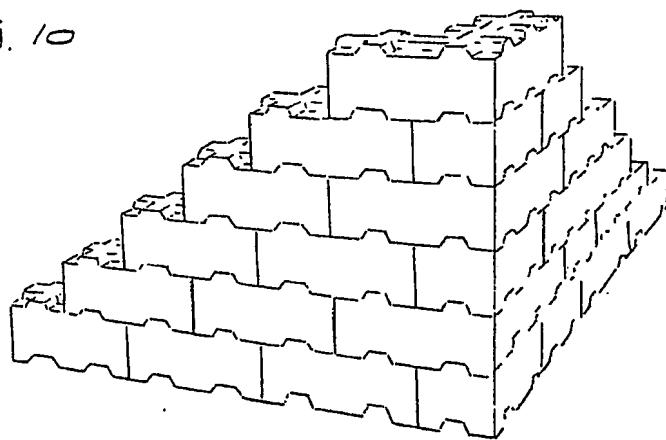


FIG. 11

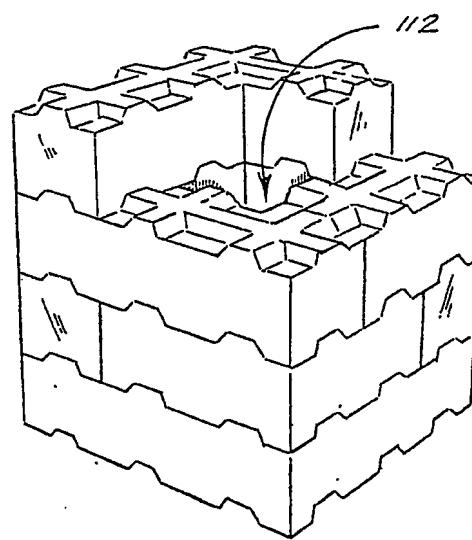
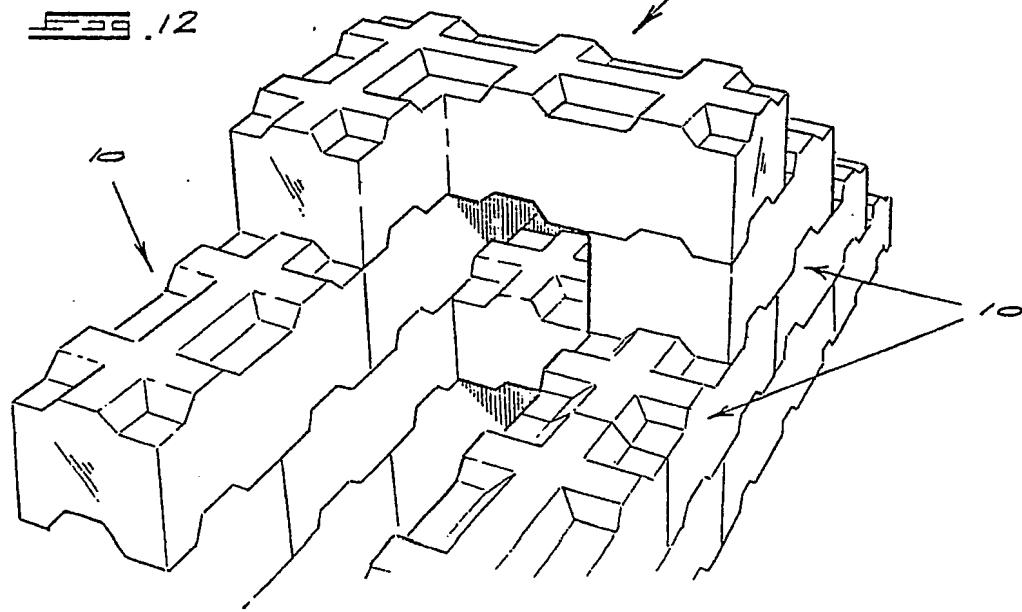


FIG. 12



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FIG. 13

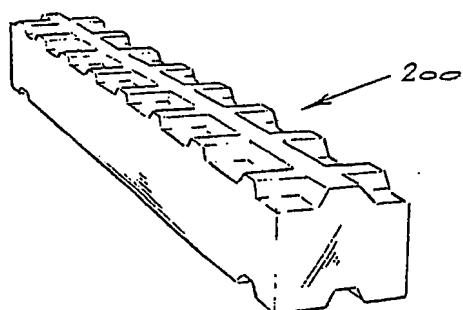


FIG. 14

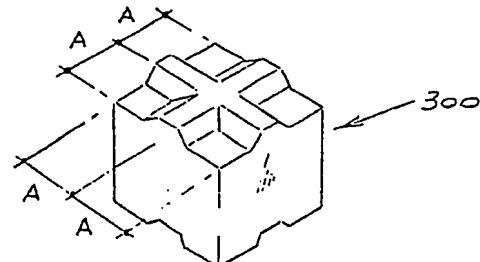


FIG. 15

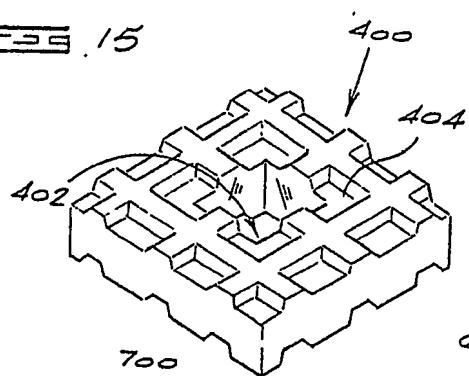


FIG. 16

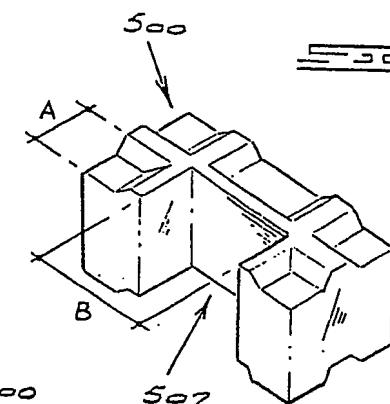


FIG. 17

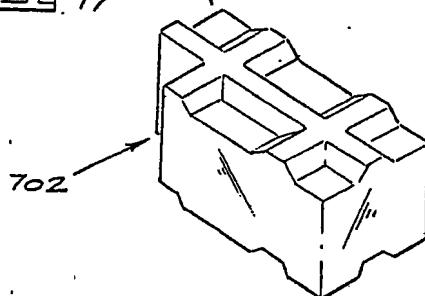


FIG. 18

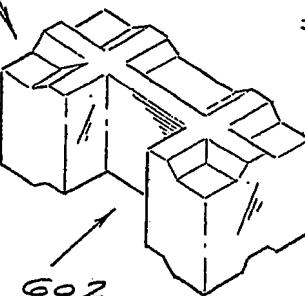
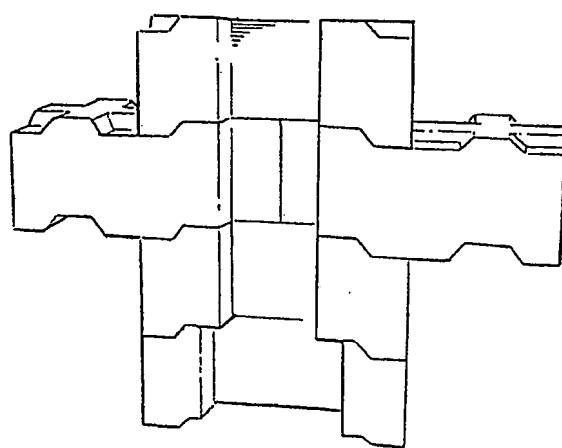
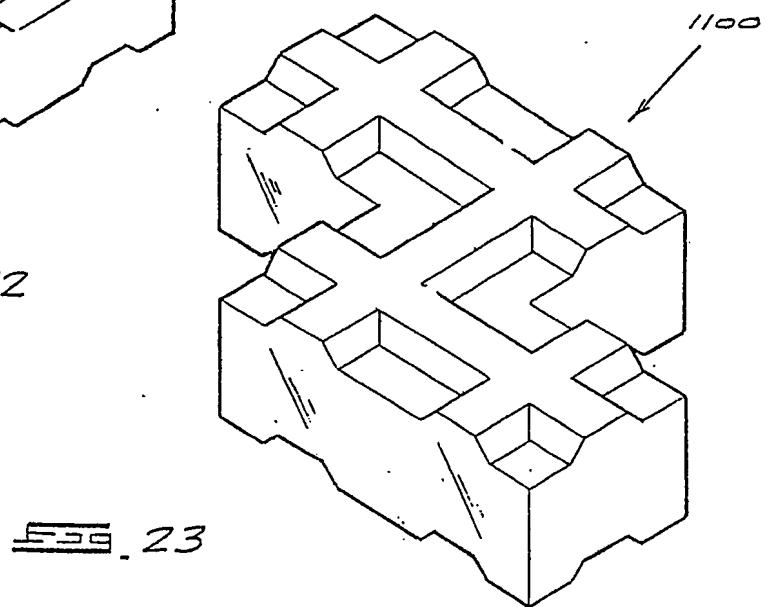
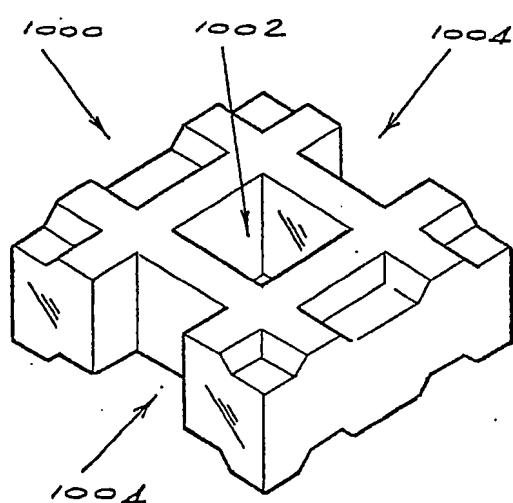
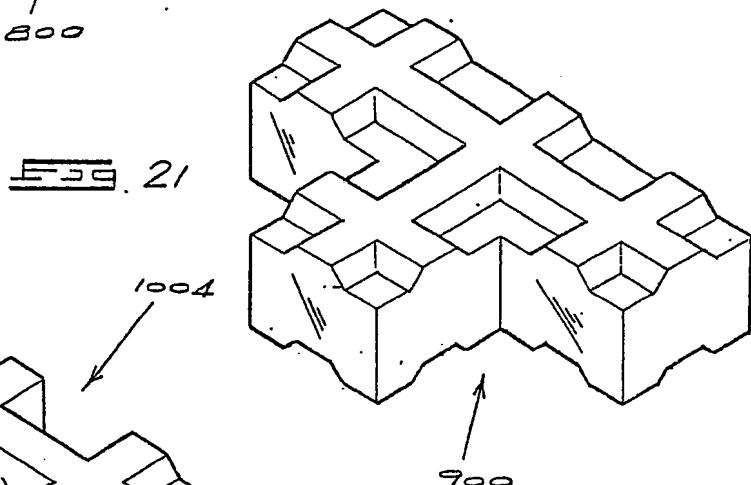
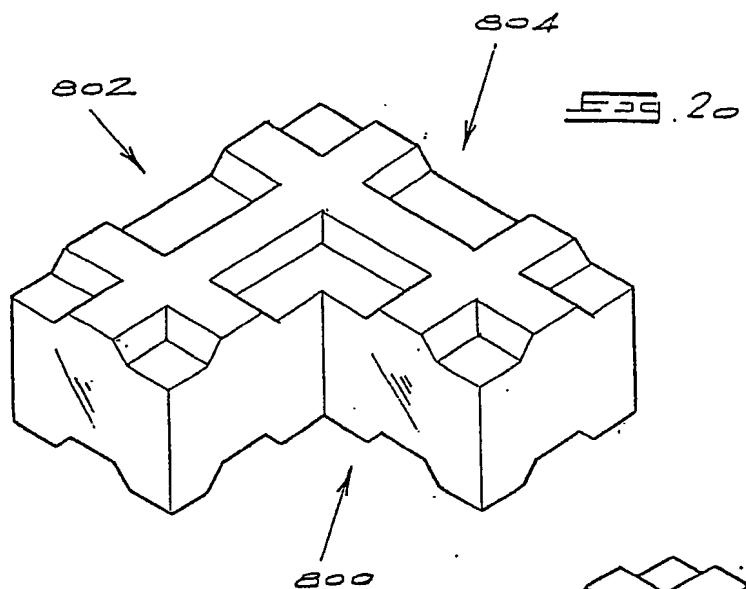


FIG. 19



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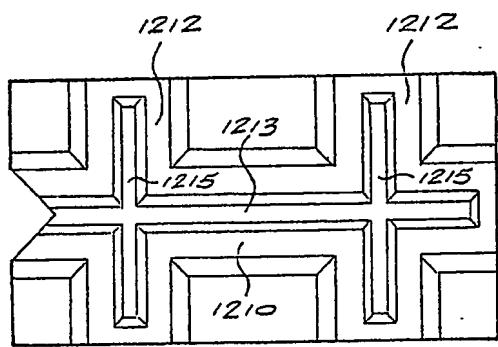
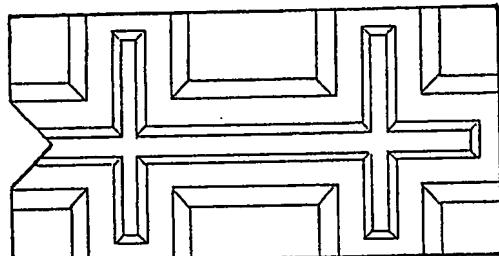
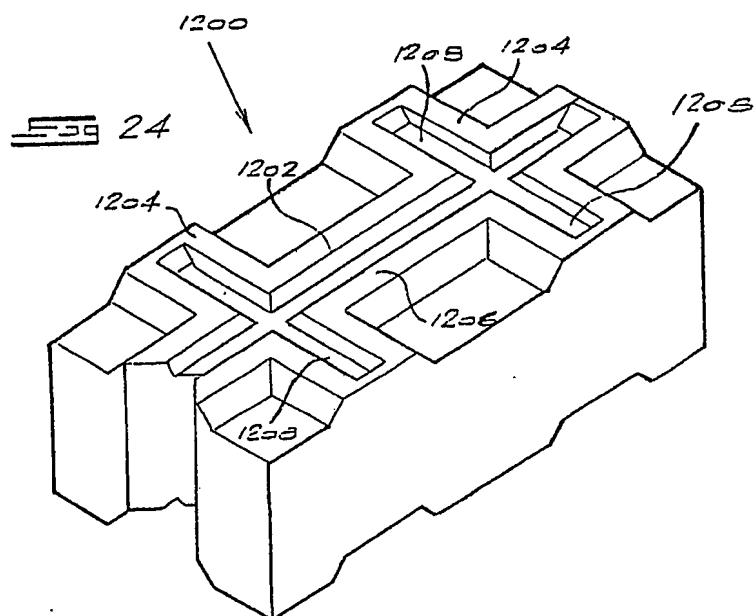


FIG 25

FIG 26

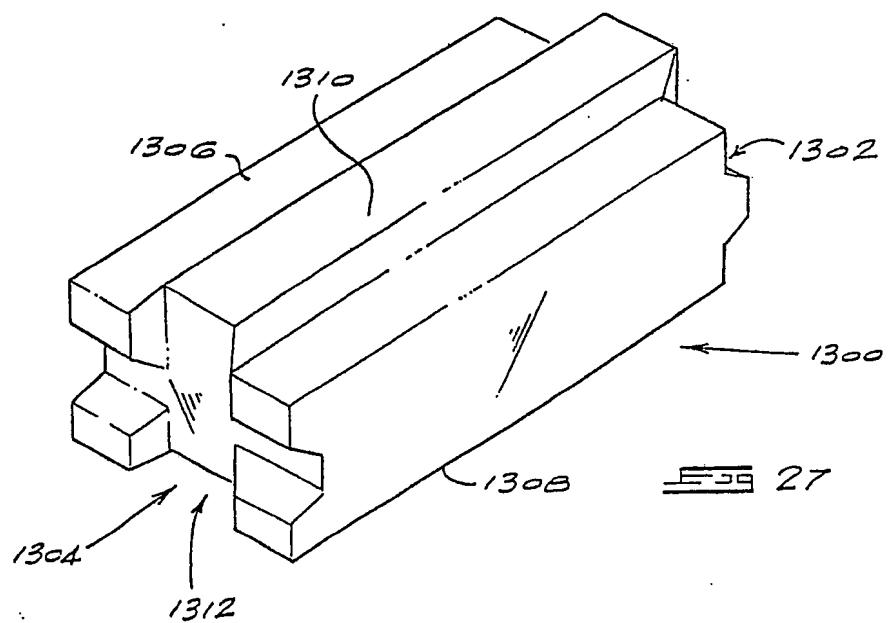


FIG 27

SPECIFICATION

Building blocks

5 THIS invention relates to a building block of interlocking type.

Most known interlocking building blocks have projecting formations on one major surface and corresponding recesses on an opposite major surface. This enables them to be located together in a manner which locks them at least to some extent against movement from their positions in a structure.

The present invention seeks to provide a novel and alternative form of interlocking building block.

15 An interlocking building block according to the present invention has complementally interlocking projections and recesses on opposite surfaces thereof, the projections of the block being receivable complementally by the recesses of another neighbouring block, wherein the projections are in the form of ribs which are arranged to form at least one upstanding cruciform shape.

A preferred, basic block of this type is generally of rectangular configuration with one of its major 25 surfaces having a rib which extends in the long direction of the block and transverse ribs which extend at right angles to the first-mentioned rib so as to define two cruciform shapes.

Various other forms of block of the type defined 30 above are also possible, the block in each case having ribs which define one or more cruciform shapes on one major surface of the block and a recess on an opposite major surface which is complementary in shape to the ribs.

35 The invention also provides a block wherein the block is generally oblong rectangular in shape with four major side surfaces and two minor end surfaces, one of the end surfaces being provided with ribs which define at least one upstanding cruciform shape.

40 Some embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:—

Figures 1, 2 and 3 show perspective, plan and underplan views respectively of a first embodiment of 45 building block according to the invention;

Figure 4 shows how blocks of the type seen in Figures 1 to 3 can be arranged in stretcher bond fashion;

Figure 5 shows how blocks of the type seen in 50 Figures 1 to 3 can be arranged in stacked fashion;

Figure 6 shows how blocks of the type seen in Figures 1 to 3 can be used to form the corner in a building;

Figures 7, 8 and 9 show perspective, plan and 55 underplan views of a second embodiment of building block according to the invention;

Figure 10 shows how blocks of the type seen in Figures 7 to 9 can be used to form a corner;

Figure 11 shows how blocks of the type seen in

60 Figures 7 to 9 can be used to form a colum box;

Figure 12 shows how blocks of the type seen in Figures 7 to 9 can be used in the formation of a cavity

wall;

Figures 13 to 18 show perspective views of other 65 embodiments of building block according to the invention;

Figure 19 shows how blocks of the type seen in Figures 16 and 18 are stacked; and

Figures 20 to 23 show perspective views of other 70 blocks according to the invention.

Figures 24 to 26 show perspective, plan and underplan views of yet another block according to the invention; and

Figure 27 shows a perspective view of another block 75 according to the invention.

The building block 10 seen in Figures 1 to 3 is basically rectangular in shape with dimensions which correspond to the dimensions of a standard building brick. The block 10 has an upper major surface 12 and

80 a lower major surface 14. Upstanding ribs 16 are provided on the upper major surface 12 to provide a double cruciform configuration as illustrated. A longitudinal rib 16A extends from one end 18 of the block to the opposite end 20. Transverse ribs 16B extend from 85 one side of the block to the opposite side 24. The side edges 26 of the ribs 16 are all bevelled at 45° to the major surface 12.

The lower major surface 14 of the block 10 is formed with a complementary recess 28 which provides the

90 double cruciform configuration seen in Figure 3. A longitudinal part 28A of the recess 28 extends from one end 18 to the opposite end 20, while transverse parts 28B of the recess extend from one side 22 to the opposite side 24. The sides 30 of the recess are 95 bevelled at 45° to the plan of the major surface 14.

The dimensions A and B in Figures 2 and 3 illustrate the complementary nature of the ribs 16 and the recess 28. The dimension B is exactly twice the dimension A.

The provision of ribs 16 on the upper major surface 100 12 and of the recess 28 on the lower major surface 14 enables blocks 10 to be interlocked with one another in a variety of configurations. Figure 4 illustrates how blocks 10 can be interlocked in stretcher bond fashion, with one half of an upper block overlapping and

105 interlocking with one half of a lower block. Because of the dimensional relationships, blocks 10 can also be stacked in stretcher bond fashion to form a corner, such as that seen in Figure 6. Figure 5 illustrates a series of blocks 10 which are merely stacked one on

110 top of the other in perfect registry. Various other configurations which are not illustrated are also possible.

Figures 7 to 9 illustrate a second embodiment 100 of block according to the invention. The block 100 is

115 generally rectangular in vertical cross-section but is L-shaped in plan view. On its upper major surface 102, the block 100 is provided with upstanding ribs 104 which define four cruciform shapes. As in the case of the ribs 16 of the previous embodiment, the ribs 104 have side edges 106 which are bevelled at 45° to the plane of the upper major surface.

The lower major surface 108 of the block 100 is formed with a complementary recess 110 which defines four cruciform shapes as illustrated in Figure 9. The

side edges 112 of the recess 110 are bevelled at 45° to the plane of the lower major surface 108. The dimensions A and B in Figures 8 and 9 are identical to the dimensions A and B in the Figures depicting the previous embodiment. Thus the long leg of the L-shape is exactly one and a half times the length of the block 10 while the shorter leg of the L-shape has the same length as the block 10. These dimensional relationships enable the block 100 to mate in interlocking fashion with blocks 10 as well as with one another.

An alternative version of an L-shaped block has longer and shorter legs identical in dimension to the legs of the block 100 but the shorter leg extends from the longer leg in the opposite direction to that of the block 100. A part of the shorter leg of such an alternative version is indicated partially in dotted lines in Figure 9.

Blocks 100 (and the alternative version referred to above) are extremely versatile. Figure 10 illustrates how such blocks can be combined with blocks of the type seen in Figures 1 to 3 to form a corner in a building. Figure 11 illustrates how such blocks can be combined with one another to form a column box which has a vacant core area 112. After construction of the column box to the required height, the vacant central core area can be filled with concrete, with vertical steel reinforcement if necessary.

Figure 12 shows how blocks 10 of the type seen in Figures 1 to 3 can be combined with L-shaped blocks 100 to form a cavity wall with the clear spacing between the two skins of the wall being spaced apart from one another by the width of a block 10 (i.e. by a distance 2A). In most conventional cavity walls, the spaced skins are not connected to one another by brickwork, and it is considered advantageous to key them to one another in the manner illustrated in Figure 12.

Figure 13 illustrates a third embodiment 200 of block according to the invention. The block 200 is similar in nature to the first embodiment of block described with reference to Figures 1 to 3 but is substantially longer. The major upper surface 202 of the block 200 has upstanding ribs which define eight cruciform shapes, while its major lower surface has a complementary recess also defining cruciform shapes, in this case two. The block 200 is intended to serve as a lintel and the centre to centre spacing of its transverse ribs is equal to the dimension B. The ribs and recess of the block 200 enable it to be interlocked with blocks such as the block 10 and the block 100 at either end thereof.

Figure 14 illustrates a further block 300 according to the invention. The block 300 is formed as exactly one half of a block 10 and its dimensional characteristics are indicated in Figure 14. Once again, the block has upstanding ribs on its upper major surface and a complementary recess in its lower major surface. In this case, the upstanding ribs define a single cruciform shape as illustrated. The block 300 is used in the same manner as a half-brick in conventional rectangular brick wall construction but is, of course, able to interlock with neighbouring blocks of the kind described previously.

Figure 15 illustrates yet another advantageous embodiment of the invention. The block 400 of Figure 65 is square in plan view and provides a central vacant

cavity 402. Once again, upstanding ribs are provided on the upper major surface 404 and a complementary recess is provided in the lower major surface. Blocks 400 can be stacked one on top of the other to form a

column box the vacant central core of which can subsequently be filled with concrete. The rib spacings and dimensions of the block 400 correspond to the spacings of the ribs in the previous embodiments, enabling the block 400 to mate with the other kinds of

block already described.

The block 500 of Figure 16 is similar to the block 10 of the first embodiment, but differs from it in that a cut-out 502 is provided. The cut-out, which has a length equal to the dimension B and a width equal to

the dimension A, is sized to accommodate a standard terminal box for an electrical plug top.

Figure 18 illustrates another block 600 which also has a cut-out, in this case numbered 602. The length of the cut-out 602 is slightly less than that of the cut-out

502 and is provided to accommodate electrical and other service conduits in a wall. Figure 19 illustrates how blocks 600 can be combined with a block 500 to provide space for the accommodation of electrical and other surface conduits and an electrical plug top

terminal. Once the conduits and plug top terminal have been correctly located in the cut-outs, the cut-outs can be grouted up with a suitable cementitious mortar.

Figure 17 illustrates yet another block 700 according to the invention. In this case the block 700 is identical to the block 10 of the first embodiment except that it has a cut-out 702 at one corner. The cut-out 702 can also be used for accommodating electrical or other service conduits.

Figures 20 to 23 show other forms of block according to the invention. The block 800 seen in Figure 20 is similar to the corner block 100 seen in Figure 7, but, instead of having legs of unequal length, it has legs 802, 804 of equal length.

The block 900 seen in Figure 21 is T-shaped in plan view and will clearly be useful in the construction of transverse partition walls.

The block 1000 seen in Figure 22 has a central cavity 1002 and is provided with cut-outs 1004 on opposite sides. This block is useful in the construction of double walls with the central cavity 1002 serving to accommodate services, such as electrical conduits and the like. Because of the cut-outs 1004, the block can be combined with blocks 500 or 600 described previously to form a wall in which there is easy access to services.

The block 1100 of Figure 23 is Z-shaped in plan view and is useful in the construction of double walls.

The block 1200 seen in Figures 24 to 26 is somewhat similar to that of Figures 1 to 3. In this case, the upstanding ribs 1202, 1204 on one major surface of the block are themselves recessed. The recess includes a longitudinal groove 1206 and two transverse grooves 1208 which define two cruciform shapes as illustrated.

The opposite major surface of the block has a double cruciform recess similar to that seen in Figure 3 with a longitudinal groove 1210 and with two transverse grooves 1212. The bases of the grooves 1210 and 1212 are themselves recessed, the recess having a double cruciform shape with a longitudinal groove 1213 and transverse grooves 1215.

It will also be noted that one end of the block 1200 is formed with a triangular recess 1214.

The block 1200 is intended for use at the edge of a window frame in a building, the upright sides of the frame being received in the recesses 1214. It will be appreciated that when blocks 1200 are laid one upon the other during construction of the wall, the longitudinal grooves 1206 and 1213 of the various blocks will mate with one another to define a cavity extending in the direction of the wall. If the small portions 1217 (Figure 25) existing at the ends of the grooves 1206 are knocked out of the blocks before they are laid, the mating grooves 1206 and 1213 will be continuous. The continuous grooves can accommodate reinforcement in the form of a steel wire or bar. Also, the grooves can receive laterally extending tabs associated with the upright sides of the window frame.

Figure 27 illustrates yet another block 1300 in accordance with the invention. In this case, it is not the major surfaces of the block which are provided with cruciform projections and recesses, but the minor end surfaces. Thus one end surface 1302 is provided with an upstanding cruciform shape while the opposite end surface 1304 is provided with a complementary cruciform recess. The major surfaces 1306 and 1308 of the block are formed with a longitudinal rib and a longitudinal recess 1310 and 1312 respectively. It will be appreciated that blocks of the kind illustrated in Figure 27 will be able to mate with one another end-to-end in one course of blocks and also with blocks immediately above and below in neighbouring courses of blocks.

Each of blocks described above can be cast integral in concrete or any other settable mix, although plastics and wood are also possibilities. When the various blocks are combined one another in the chosen configuration to form the walls of a building, they can be laid dry on top of one another with their outer surfaces subsequently being plastered with a conventional mortar mix to bond them firmly to one another. Alternatively, the ribs and recesses can have applied to them a suitable adhesive, possibly in the form of a cementitious mortar paste, so that they will bond firmly to one another when laid in the chosen configuration. Yet another possibility is for the whole block to be dipped in a suitable cementitious paste or other adhesive before laying. Irrespective of the manner in which the blocks are bonded to one another, it will be appreciated that their cruciform ribs and recesses will ensure that a block cannot move relative to its upper and lower neighbours in a laid wall. In the case of the Figure 27 version, the block will also be unable to move relative to its endwise neighbours.

The terms "upper" and "lower" have been used throughout the specification to indicate the orientation in which a block will normally be positioned in use. These terms are not intended to be limiting on the orientation of a block which could, of course, be orientated in any other way while still achieving its interlocking function.

CLAIMS

1. An interlocking building block which has complementally interlocking projections and recesses on opposite surfaces thereof, the projections of the block

being receivably complementally by the recesses of another neighbouring block, wherein the projections are in the form of ribs which are arranged to form at least one upstanding cruciform shape.

70 2. The interlocking block of claim 1 wherein the block is of generally rectangular configuration with one of its major surfaces having a rib which extends in the long direction of the block and transverse ribs which extend at right angles to the first-mentioned rib

75 so as to define two cruciform shapes.

3. The interlocking block of claim 2 wherein the centre-to-centre spacing of the transverse ribs is equal to half of the overall length of the block, wherein each transverse rib is spaced from an end of the block by a

80 distance equal to one half of the centre-to-centre spacing of the transverse ribs and wherein the block is symmetrical about the centre line of the rib which extends in the long direction of the block.

4. The interlocking block of claim 1 wherein the block is of generally rectangular configuration with one of its surfaces having a first rib and second rib extending at right angles to the first rib to define a single cruciform shape.

5. An interlocking block of claim 1 wherein the block is L-shaped with a plurality of cruciform shapes defined by ribs on one major surface of the block and with complementary recesses on an opposite major surface of the block.

90 6. The interlocking block of claim 5 wherein one leg of the L-shape is longer than the other and there are four upstanding cruciform shapes defined by ribs on one major surface of the block.

7. The interlocking block of claim 1 wherein the block has a plurality of upstanding cruciform shapes defined by ribs on one major surface thereof and a lesser number of cruciform shaped recesses on an opposite major surface thereof.

100 8. The interlocking block of claim 7 wherein the one major surface of the block has eight upstanding cruciform shapes defined by ribs and the opposite major surface has two cruciform shaped recesses.

9. The interlocking block of claim 1 wherein the block is square in shape and has a central cavity extending therethrough.

110 10. The interlocking block of claim 1 wherein the block is rectangular in shape and has a cut-out in one side or in a corner thereof.

11. The interlocking block of claim 1 wherein the block is generally square in shape, has a central cavity therethrough and has cut-outs in opposite sides thereof.

12. The interlocking block of claim 1 wherein the block is T-shaped.

13. The interlocking block of claim 1 wherein the block is Z-shaped.

14. The block of any one of claims 1 to 3 wherein the ribs are recessed and wherein the bases of the recesses are recessed.

15. The block of claim 14 wherein the recesses in the ribs and in the bases of the recesses define cruciform shapes.

16. The block of claim 1 wherein the block is generally oblong rectangular in shape with four major side surfaces and two minor end surfaces, one of the end surfaces being provided with ribs which define at

least one upstanding cruciform shape.

17. The block of claim 16 wherein one of the major side surfaces is provided with a longitudinal rib and an opposite major surface is provided with a complementary longitudinal groove.
18. The block of any one of the preceding claims wherein each rib has sides which are bevelled with respect to the surface of the block carrying that rib.
19. An interlocking block substantially as herein described with reference to Figures 1 to 3, Figures 7 to 9, Figure 13, Figure 14, Figure 15, Figure 16, Figure 17, Figure 18, Figure 19, Figure 20, Figure 21, Figure 22, Figure 23, Figures 24 to 26 or Figure 27 of the accompanying drawings.

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